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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/037,976	01/03/2002	Naoki Nishida	15162/04220	7848

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EXAMINER

VALENCIA, DANIEL E

ART UNIT PAPER NUMBER

2874

DATE MAILED: 04/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/037,976

Applicant(s)

NISHIDA ET AL.

Examiner

Daniel E Valencia

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Inventorship***

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

### ***Specification***

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites the limitation "the groove" in the second line of the claim. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 1 and 4-6 rejected under 35 U.S.C. 102(e) as being anticipated by Sakata U.S. Patent No. 6,445,845. Refer to the appropriate drawings or parts of the specification. Sakata discloses an optical switch with all the limitations of the abovementioned claims. Regarding claim 1, Sakata discloses an optical switch (fig 5 and 7) for changing over a running direction of a light passing through an optical waveguide between a first direction and a second direction by moving a switching

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member (col. 7, lines 5-15) disposed on an optical path of an optical waveguide, wherein the switching member has a plurality of switching positions for selectively guiding each of lights of at least two different wavelengths (fig 7 and col. 10, lines 35-65) into the first direction or a second direction, respectively. Sakata further discloses that the switching member is configured to move within the groove intersecting with the optical waveguide, wherein the groove is filled with liquid that moves the switching member (col. 7, lines 5-20), as mentioned in claims 4-6.

Claims 9 and 11-13 are rejected under 35 U.S.C. 102(e) as being anticipated by McBride U.S. Patent Application Publication No. 2002/0048425 A1. Refer to the appropriate drawings or parts of the specification. McBride discloses a microfluidic optical electrohydrodynamic switch with all the limitations of the abovementioned claims. Regarding claim 9, McBride discloses an optical switch (fig 1-5) comprising: a groove (102) intersecting with an optical waveguide (108) and filled with liquid (104); a switching member (126 and 104) movably provided in the groove; and a micro pump coupled to the groove for transferring the liquid in the groove. McBride further discloses that the micro pump (paragraphs 15 and 16) element has no valve, as explained in claim 11. Referring to claims 12 and 13, McBride discloses that at least part of the switching member has a refractive index different from the fluid (126). McBride discloses that the refractive index of the optical path matches with one of those of the at least a part (104 index matching fluid) of the switching member and the fluid.

Claims 9, 11, 12, and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Barth U.S. Patent No. 6,360,775. Refer to the appropriate drawings or parts of the specification. Barth discloses a capillary fluid switch with asymmetric bubble chambers with all the limitations of the abovementioned claims. Regarding claims 9 and 11, Barth discloses an optical switch (fig 6) comprising: a groove (not labeled) with an optical waveguide and filled with liquid (col. 2, lines 30-60); a switching member (402) movably provided in the groove; and a micro pump without a valve (col. 2, lines 41-42) coupled to the groove for transferring the liquid in the groove. Barth discloses that at least part of the switching member (402) has a refractive index different from that of the fluid and at least a part (316) that has a refractive index that matches with the optical path, as explained by instant claims 12 and 13.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Mitchell U.S. Patent No. 4,991,925. Refer to the appropriate drawings or parts of the specification. Mitchell discloses a spectrum shifting optical switch that teaches all the limitations of the claims. Regarding claim 1, Mitchell discloses an optical switch (fig 2 and 4) for changing over a running direction of a light passing through an optical waveguide between a first direction (backward) and a second direction (forward) by moving a switching member (26, 28, 34, 36, 38, and 44) disposed on an optical path of an optical waveguide (16), wherein the switching member has a plurality of switching

positioned for selectively guiding each of lights of at least two different wavelengths into the first direction of second direction, respectively (col. 5, lines 1-35). Mitchell's disclosure shows that a plurality of switching portions includes a first switching portion (26) and a second switching portion (28), wherein the first switching portion is for guiding lights of first wavelengths into the first and second directions, respectively, and wherein the second switching portion is for guiding lights of the first and second wavelengths into the second and first directions (see "Best Mode for Carrying Out the Invention"). With reference to claim 3, Mitchell's disclosure further shows that the switch further comprises a third switching portion (34) for guiding lights of the first and second wavelengths into one of the first and second directions. Mitchell's disclosure shows that they are interference filters (fig 4 and 6).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakata in view of Barth. Refer to the appropriate drawings or parts of the specification. Sakata as applied above, discloses a fluid filled optical switch with a movable switching member for redirecting light of different wavelengths. However, the reference is silent as to how the switching member is moved.

On the other hand, Barth also discloses a fluid filled optical switch with a movable switching member that teaches the limitation that the Sakata reference lacks.

Regarding claim 7, Barth discloses that the switching member is moved by a micro pump (col. 2, lines 30-bottom). Barth discloses that it is advantageous to use a micro pump to move the switching member in fluid, because the pump provides energy to the member in order to move it. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use a pump to move the switching member in Sakata's device.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Al-hemyari U.S. Patent No. 6,493,482. Refer to the appropriate drawings or parts of the specification. Al-hemyari discloses an optical switch having a planar waveguide and a shutter actuator. Regarding claim 10, Al-hemyari discloses that a piezoelectric element moves a switching element in a groove filled with fluid (fig 8 and col. 9, lines 5-15). Although Al-hemyari does not explicitly state the use of a pump, the use of electrodes with piezoelectric elements for moving a switching element in a groove filled with fluid (col. 5, lines 30-50) would inherently function as a pump. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the electrodes and piezoelectric elements in Al-hemyari could be used as a pump.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barth in view of Kapany U.S. Patent No. 6,356,679. Refer to the appropriate drawings or parts



of the specification. Barth as applied above, discloses an optical switch, with a movable switching element disposed in a groove filled with fluid. However, the reference fails to teach the use of an interference filter as the movable switching element.

On the other hand, Kapany discloses an optical routing element with a switching element disposed in fluid that teaches the limitations that the Barth reference lacks. Specifically, Kapany discloses that an interference filter is used, because it allows wavelengths to be selectively routed (col. 7, lines 15-20). This is advantageous, because it can be used for wavelength division multiplexing applications. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use an interference filter to selectively switch certain wavelengths in the device disclosed by Barth.

### ***Conclusion***

The prior art documents submitted by the applicant in the Information Disclosure Statement filed on January 3, 2002, have all been considered and made of record (note attached copy of form PTO-1449).

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Edwards U.S. Patent No. 6,389,189 discloses a fluid encapsulated MEMS optical switch, wherein the switching member is movable in a fluid filled trench.

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Zanzucchi U.S. Patent No. 5,632,876 discloses an apparatus and methods for controlling fluid flow in microchannels for switching.

Fouquet U.S. Patent No. 6,<sup>32</sup>~~22~~4,316 discloses a fabrication of total internal reflection optical switching with vertical fluid filled holes, wherein the switchable members are moved within a fluid filled channel.

Le Pesant U.S. Patent No. 4,818,052 discloses a device for optical switching by fluid displacement and a device for the composition of a line of points, wherein the device uses electrodes to move a switching member in a channel.

Scobey U.S. Patent No. 6,320,996 discloses a wavelength selective optical switch, with multiple switching portions for redirecting different wavelengths in different directions.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel E Valencia whose telephone number is (703)-305-4399. The examiner can normally be reached on Monday-Friday 9:30-6:00.

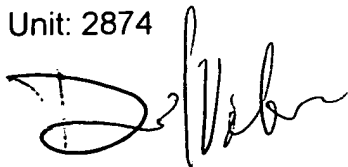
The fax phone numbers for the organization where this application or proceeding is assigned are (703)-308-7724 for regular communications and (703)-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-0956.

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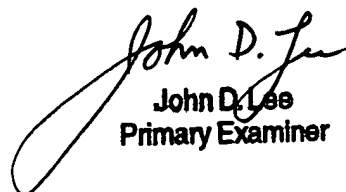
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A handwritten signature in black ink, appearing to be 'D. Lee'.

dv

April 1, 2003

A handwritten signature in black ink, appearing to be 'John D. Lee'.

**John D. Lee**  
**Primary Examiner**